REMARKS

Claims 1-16 are pending in the application. Claims 2-9, 11 and 13-16 have been indicated as allowable. Claims 1, 10 and 12 stand rejected under § 103 in view of the Hayes '239 patent. The examiner's indication of allowable subject matter is acknowledged and appreciated. The rejection of claims 1, 10 and 12 under § 103 in view of Hayes '239 is respectfully traversed.

Claim 1 will be addressed first. The examiner concludes that the Hayes '239 patent includes all of the features of claim 1 except for the step of modulating data into synchronization frames. The examiner concludes the claimed modulation step is obvious because Hayes indicates (as would be true for any radio frequency transmission) that Hayes can employ a modulation/demodulation scheme. Applicants dispute that Hayes renders this step obvious and also point out that the opinion expressed in the office action concerning Hayes disclosing the claim 1 step of pseudo-chaotically coding is incorrect.

In the pseudo-chaotically coding step in claim 1, the digital data is coded by allocating the digital data to a state sequence assigned according to a chaotic map. In this manner, there is a direct synthesis of the pseudo-chaotic signal starting with the binary data to be transmitted. The examiner's attention is directed to an explanation of this in page 9 beginning at line 8. Hayes, in contrast, discloses a specific method that relies upon synchronizing an oscillator to a Lorenz trajectory. In all of the embodiments in

Hayes '239, the encoding involves determining this trajectory and there is no allocation of the digital data to a state sequence followed by a subsequent digital to analog conversion. As described, for example, in column 4, beginning at line 56, bits are mapped to a locus of a Lorenz attractor and the mapping forces an oscillator to a trajectory interval. This is not a mapping onto a state sequence as is required by the claims. In all of these embodiments of Hayes the oscillator is an analog signal and there is not a mapping onto a state sequence. The examiner points to Fig. 15, but Fig. 15 of the Hayes '239 patent is completely consistent with the other embodiments and there is no mapping onto a state sequence as is required by the claims. In Fig. 15 of Hayes, the digital circuitry is used as a look-up to set the trajectory of the chaotic attractor as described in column 13, in the paragraph beginning at line 28. There is no mapping of the data prior to the D-to-A conversion by the D/A converter 96. Instead, "the segment memory 94 thus contains 2^N segments of length M that allow the source to simply read points from memory to the D/A 96 that, in sequence, generate the chaos signal trajectory." The selection of the point that determines the trajectory does not constitute a mapping of digital data to a state sequence as required by claim 1.

The examiner's conclusion that it would be obvious to modify Hayes to require the converting step of claim 1, to modulate the pseudo-chaotically coded data into synchronization frames is also not supported by the evidence. The stated motivation of the examiner is that it would have been obvious "in order to transmit the coded data to

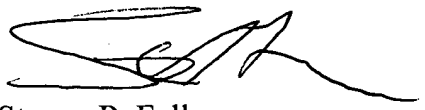
the receiver with an infinite precision." Hayes already contemplates transmission and reception with as much precision as is allowed by the particular embodiment described in Hayes. Hayes' method of taking a trajectory for the chaotic oscillator has nothing to do with a synchronization frame and it is not clear from the evidence of record how such a technique would be adapted to synchronization frames. The synchronization frames permit, for example, a pulse position to be a form of chaotic encoding. There is no similar disclosure in Hayes and the examiner has pointed to no additional evidence to support the conclusion.

Claims 10 and 12 will now be addressed. The examiner concludes that Hayes renders obvious these claims because "it would have been obvious to an artisan to "to correct the signal transmitted from the transmitter by using the Viterbi decoder in order to recover the optimum signal." This position is completely unsupported by Hayes. There is no evidence as to how a Viterbi decoder could be used in the Hayes patent. Hayes uses a Lorenz attractor approach which is described throughout the patent. In contrast, as described in the instant specification, the embodiments of the invention produce symbolic dynamics that enable realization of the Viterbi detector in the receiver with a limited number of states. The claimed embodiments give rise to symbolic dynamics that permit the limitation of Markov partition. The simplified decoding is an important feature of the invention and nothing in Hayes suggests that a similar approach could be used.

For all of the above reasons, the rejections should be withdrawn. If the examiner has any questions or would like to discuss the case, the examiner is invited to contact the undersigned attorney at the below-listed number.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By 
Steven P. Fallon
Registration No. 35,132

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300 South Wacker Drive, Suite 2500
Chicago, Illinois 60606
(312) 360-0080
Customer No. 24978

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